meter stem is graduated empirically to represent certain conditions of the atmosphere. In another form of the apparatus, wires are sealed into the stem of the thermometer and the rise of the mercury brings about a contact and rings a bell.—G. W. McD.

Thermo-electric pyrometer. W. S. Peake, Cambridge, England, Assignor to Taylor Instrument Companies, Rochester, N.Y. U.S. Pat. 1,025,715, May 7, 1912.

The leads connecting a thermo-couple with a current indicating or measuring device are composed of materials dissimilar to the materials forming the thermo-couple, and are chosen so as to compensate for variations of temperature at their junction therewith. In an example, one of the leads is composed of copper and the other of a low resistance alloy consisting of from 99·9 to 95 per cent. of copper and from 0·1 to 5 per cent. of nickel.—H. H.

Pyrometer; Acoustic ——. C. de A. M. Costa. Fr. Pat. 437,560, Nov. 13, 1911.

Two similar whistles are mounted on tubes, of which one is kept at a known temperature and is fitted with a piston. The other is placed in the furnace. It is of the same total length, and on passing compressed air into it, a certain note is given dependent on the temperature. The other whistle is adjusted in length by means of the piston to give the same note, and the temperature of the furnace is determined by the equation:—

$L' = L \sqrt{\frac{T'}{T}}$, where T is the required temperature, T′ is the temperature of the cold whistle, L is the length of the hot whistle, and L′ is the adjusted length of the cold whistle.—G. W. McD.

Apparatus for determining the consistence of bituminous road materials. Eng. Pat. 16,997. *See* IX.

XXIV.—MISCELLANEOUS ABSTRACTS.

Enzymes which attack mannans, galactans and celluloses; Investigations on ——. H. Bierry and J. Giaja. Biochem. Zeits., 1912, **40**, 370—389.

The authors give a historical summary of previous work relating to the occurrence, composition and enzymic hydrolysis of complex polysaccharides containing mannose and galactose residues. These substances, some of which are soluble and others insoluble in water, are widely distributed amongst plants, especially in seeds, tubers, etc., and they occur also in algæ and fungi. Enzymes capable of hydrolysing them, in a more or less specific manner, occur in plants and similar enzymes are present in the digestive juices of some of the lower invertebrate animals. The author has studied the saccharification of typical mannans and galactans by the digestive juices of *Helix pomatia* (Roman snail), *Astacus fluviatilis* (crayfish), *Homarus vulgaris* (lobster) and *Maja squinado*. In the first two cases the juices saccharified all the mannans and galactans presented to them, whilst in the last two cases certain ones only were hydrolysed. Some juices produce only mannose, and others only galactose from mannogalactans, and it is therefore probable that the mannogalactans are really mixtures of mannans and galactans, for the saccharification of which two classes of enzymes—mannanases and galactanases—are required. No such enzymes appear to be present in the digestive juices of the higher vertebrate animals.—J. H. L.

Books Received.

Potash-bearing Rocks of the Leucite Hills, Sweetwater County, Wyoming. Bulletin 512, U.S. Geological Survey, Washington.

8vo pamphlet of 39 pages, containing nine figures and maps in the text.

A Dictionary of Applied Chemistry. By Sir Edward Thorpe, C.B., LL.D., F.R.S., assisted by eminent contributors. Revised and enlarged edition. In five volumes. Vol. II. With Illustrations. Longmans, Green and Co., 39, Paternoster Row, London. New York, Bombay, and Calcutta. 1912. Price £2 5s. net.

Large 8vo volume, containing 786 pages of subject matter, with numerous illustrations. It commences with a table of abbreviations of the titles of journals and books, and a list of contributors. The first subject considered in Vol. II is "Chian turpentine," and the concluding articles are "Gorse," "Gossypitrin," and "Goudang wax." Among the articles treated in considerable detail may be mentioned the following:—I. Chlorine. II. Corrosion (iron and steel). III. Coke, and recovery of by-products. IV. Copper. V. Cyanides. VI. Diazo-compounds. VII. Disinfectants. VIII. Distillation. IX. Dyeing and Dyestuffs. X. Ethyl compounds, etc. XI. Explosives. XII. Fermentation. XIII. Fertilisers. XIV. Fuel. XV. Gas, coal-; also gas mantles. XVI. Glass. XVII. Glycerin.

Digest of Comments on the Pharmacopœia of the United States (Eighth Decennial Revision), and for the National Formulary (third Edition) for the year 1909. By Murray G. Motter and Martin I. Wilbert. Bulletin No. 79, Hygienic Laboratory, U.S. Treasury Department, Washington.

The subject matter of this book, which contains 735 octavo pages, is classified as follows:—*General Comments* (1) Legal status and development. (2) Scope. (3) Non-pharmacopœial standards. (4) Analytical data. (5) Biologic products. (6) Vegetable drugs. (7) Pharmaceutical preparations. *International Standards* (1) International Conference for the unification of pharmacopœial formulæ for potent medicaments (Brussels). (2) Foreign pharmacopœias. (3) Comments on U.S.P. VIII. relative to the requirements of the Brussels Conference. Spanish Edition of the U.S.P. VIII. *Comments on official articles.*

Mineral Resources of the United States. Part 1, Metals. Part II, non-metals. U.S. Geological Survey, Washington.

Part I consists of 783 pages, with subject index and map, and Part II of 986 pages, with index and 19 maps. The volumes also contain 17 curves illustrative of the fluctuations in production and prices of various articles.

Circular of the Bureau of Standards. S. W. Stratton, Director. No. 32. (Department of Commerce and Labour.)

State and Municipal Regulations for the Quality, Distribution, and Testing of Illuminating Gas. 1st Edition. Issued April 1, 1912. Government Printing Office, Washington, U.S. America. 1912.

8vo volume, containing 133 pages of subject matter, subdivided and arranged as follows:—Part I.—Municipal Gas Ordinances. A. Summary of requirements now in force: (i), Candle power requirements. (ii), Heating value requirements. (iii), Purity. (iv), Pressure regulations. (v), Meter-testing requirements. (vi), Inspection, official. B. Discussion of gas ordinance requirements:—(i), Principal kinds of illuminating gas. (ii), Candle-power and heating value. (iii), Purity (Hydrogen sulphide, total sulphur and ammonia, carbon monoxide). (iv), Gas pressure. (v), Meters and meter testing. (vi), Inspector. Appointment, deputies, duties, etc. (vii), Miscellaneous requirements. C. Proposed city ordinances. Part II.—State Gas Laws. A. Summary of laws now in force. B. State control of gas service. (1), Present State inspection practice. (2), Requirements and their enforcement. (i), Form and powers of commission. (ii), Requirements and their enforcement. C. Proposed technical rules. Part III.—Gas Laws Quoted. A. Selected city ordinances. B. State laws quoted. Appendixes. Statistics of the gas industry.

Photochemische Versuchstechnik. Von Johannes Plotnikow, Dr. phil. et mag. chem. Akademische Verlagsgesellschaft m. b. H. Leipzig, Germany. 1912. Price M. 11; bound in cloth, M. 12.

8vo volume, containing 356 pages of subject matter with 189 illustrations and 53 tables, followed by alphabetical indexes of authors and subjects. The classification of the matter is as follows:—Sources of Light. I. Mercury arc light. II. Metal arc light and spark light. III. Carbon arc light. IV. Coloured flames. V. Nernst lamps. VI. Röntgen lamps. Light Thermostats. I. Light thermostat I. for outside lights. II. Light thermostat II. for liquid gas systems and external illumination. III. Light thermostat III. for internal illumination. IV. Various apparatus for investigating photochemical reactions (Plotnikow). Optical Measuring Instruments. I. Photometry. II. Light absorption measurements. Photochemical Lecture Experiments. I. Light reactions. II. Luminescence phenomena. III. Electric light demonstrations. IV. Demonstrations: Radiation phenomena. Photochemical Tables.

Tables Annuelles de Constantes et Données Numériques de Chimie, de Physique et de Technologie. Publiées sous le Patronage de l'Association internationale des Académies, par le Comité international nommé par le VIIe Congrès de Chimie Appliquée (Londres, 2 Juin, 1909). Avec la collaboration de: S. L. Archbutt, W. Biltz, M. Bodenstein, M. Boll, E. Bontoux, F. Bourion, L. Bruninghaus, C. Chéneveau, H. Colin, G. Darzens, P. Dutoit, G. Fick, H. Gaudechon, H. B. Hartley, W. Hinrichsen, A. Mahlke, R. Marquis, Michaud, J. Nannan, E. Nusbaumer, M. Piér, A. W. Porter, A. Portevin, V. Rothmund, H. Rost, J. Saphores, O. Scheuer, L. J. Spencer, Th. Strengers, E. Terroine, N. T. M. Wilsmore. Volume I. Année 1910. Gauthier-Villars. Paris. Akademische Verlagsgesellschaft, m. b. H., Leipzig. J. and A. Churchill, 7, Great Marlborough Street, London, W. 1912. University of Chicago Press, Chicago. Price 21s. 6d. net (paper). 24s. net (cloth).

Quarto volume, containing 726 pages of tabulated subject matter, and one page of errata. The tables, etc., contain constants and other data relating to the following subjects:—I. Coefficients of compressibility. II. Densities. III. Viscosity. IV. Surface tension. V. Coefficients of expansion. VI. Melting points. VII. Specific heats. VIII. Thermodynamics. IX. Vapour pressures. X. Thermal conductivities. XI. Radiation. XII. Photometry. XIII. Reflecting power. XIV. Emissive power. XV. Coefficients of absorption. XVI. Refraction and Dispersion. XVII. Spectrum analysis. XVIII. Rotatory power. XIX. Electricity. XX. Magnetism. XXI. Radio-activity. XXII. Electrons and ionization. XXIII. Atomic weights. XXIV. Atomic properties. XXV. Velocity of diffusion. XXVI. Osmotic pressure. XXVII. Degree of association. XXVIII. Mixtures, Changes of State. XXIX. Solubility. XXX. Thermochemistry. XXXI. Chemical equilibrium. XXXII. Velocity of Reaction. XXXIII. Electric conductivity of Electrolytes. XXXIV. Electromotive Forces (E.M.F.). XXXV. Colloids. XXXVI. Adsorption. XXXVII. Crystallography and Mineralogy. XXXVIII. Organic Chemistry. XXXIX. Essential Oils, Fats, and Waxes. XL. Animal Physiology. XLI. Vegetable Physiology. XLII. Engineering (Mechanical, Thermic, and Electric constants). XLIII. Metallurgy (i. Mechanical and other properties of alloys. ii. Mechanical constants). Supplement. Velocity of sound. Physical properties of ice. Vapour pressures of gases absorbed by charcoal, etc.

Paper Pulps from various Forest Woods. Experimental Data and Specimens of Soda and Sulphite Pulps. U.S. Department of Agriculture. Forest Service. Henry S. Graves, Forester. (Forest Products Laboratory Series.) Compiled by Henry E. Surface (Chemical Engineer in Forest Products.) Washington, U.S.A. 1912.

Small volume, pocket-book size, containing 29 pages of tables and subject matter, and 55 page sheets of dried pulp from various woods, etc. The subject treatment is as follows:—I. Purpose of the experiments. II. Preparation of the pulps. III. Raw materials tested. IV. Experimental data. V. Index to pulp specimens.

Bleaching and Dyeing of Vegetable Fibrous Materials. By Julius Hübner, M.Sc.Tech. (Manchester), F.I.C., Director of the Department for Bleaching, Dyeing, Printing, and Finishing, and Paper Manufacture, Municipal School of Technology, Victoria University, Manchester. With an Introduction by Raphael Meldola, D.Sc., LL.D., F.R.S. Constable and Company, Ltd., 10, Orange Street, Leicester Square, London, W.C. 1912. Price 14s. net.

8vo volume, containing 386 pages of subject matter. an Appendix of 20 pages with tables, constants, etc., and an alphabetical index. The text is illustrated with 96 engravings, and its classification is as follows:—I. Prof. Meldola's Introduction. II. The vegetable fibres. III. Water. IV. Chemicals and mordants. V. Bleaching. VI. Mercerising. VII. Mineral colours. VIII. Natural colouring matters (Artificial dyestuffs). IX. Basic cotton dyestuffs. XI. Substantive cotton dyestuffs. XII. Sulphur dyestuffs. XIII. Acid and resorcinol dyestuffs. XIV. Insoluble azo-colours, produced on the fibre. XV. The vat dyestuffs. XVI. Mordant dyestuffs. XVII. Colours produced on the fibre by oxidation. XVIII. Dyeing machinery. XIX. Testing of dyestuffs and fibres. XX. Appendix.

Theorie und Praxis des Mahlens. Von Clayton Beadle und Dr. Henry Stevens. Deutsch von Ingenieur Carl Franck. Otto Elsner Verlagsgesellschaft m. b. H. 1911.

Small 8vo volume, containing 292 pages of subject matter on the beating process and machinery in paper-making, with 34 illustrations of "beating" apparatus, hollanders, etc. It is practically a translated reprint of articles in the "Papier-Fabrikant." There are 18 chapters and an Appendix.

Trattato di Chimica Organica Generale e Applicata all'Industria. Dott. E. Molinari. Seconda edizione riveduta e ampliata. U. Hoepli. Milano. 1912. Price Lire 18.

8vo volume containing 1054 pages of subject matter, with 506 illustrations. and an alphabetical index occupying 31 pages. The text is arranged and classified in the following manner:—I. General part. II. Special part.—Derivatives of methane: (A) Hydrocarbons. (B) Halogen derivatives. (C) Alcohols. (D) Derivatives of alcohols. (E) Acids. (F) Derivatives of acids. (G) Polyhydric aldehydic or ketonic alcohols. III. Cyclic compounds: (A) Aromatic hydrocarbons. (B) Halogen-substituted derivatives. (C) Sulphonic acids. (D) Phenols. (E) Quinones. (F) Nitro-derivatives. (G) Amino-derivatives. (H) Nitro-, amino-, and thio-phenols. (I) Azo-, diazo-, and diazoamino-compounds and hydrazines. (L) Aromatic alcohols, aldehydes, and ketones. (M) Aromatic hydroxy-alcohols, hydroxy-aldehydes, and ketonic alcohols. (N) Aromatic acids. (O) Hydro-aromatic compounds. (P) Condensed benzene nuclei. (Q) Heterocyclic compounds. (R) Colouring matters: tests; textile fibres; machinery used in dyeing and finishing, etc. (S) Proteins. Glucosides and substances of unknown or uncertain constitution. Special features of the book are the descriptions of technical processes, and the trade statistics, which include figures for 1910, and in some cases for 1911.

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*New Books.

[The Roman numerals in thick type, here and under "Dissertations," refer to the similar classification of abstracts under "Journal and Patent Literature" and in the "List of Patent Applications."]

I. *Diefendorf*, H. G.: The gasoline engine, marine and stationary; its construction, operation and care. [Detroit, J. Bornman and Son.] c. 71 p. il. diagrs. 1912. 50 c.